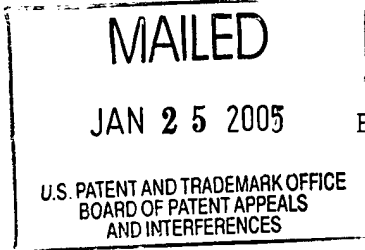


The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE



BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN A. LYTTLE

Appeal No. 2005-0219
Application No. 09/667,046

ON BRIEF

Before KIMLIN, GARRIS and DELMENDO, Administrative Patent Judges.
KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 21, 24, 25, 29 and 30. Claims 21 and 29 are reproduced below:

21. A semiconductor device, comprising:

a first interconnect metal located on or in a first interlevel dielectric layer;

a second interconnect metal located on or in a second interlevel dielectric layer, the second interlevel dielectric layer located over the first interlevel dielectric layer;

a third interconnect metal located on or in a third interlevel dielectric layer, the third interlevel dielectric layer located over the second dielectric layer; and

a via located through the second and third interlevel dielectric layers and connecting the first and third interconnect metals, the via being void of a landing pad between the second and third interlevel dielectric layers.

29. A semiconductor device, comprising:

a first metal feature located on a semiconductor surface;

a first etch stop layer located on the first metal feature;

a first interlevel dielectric layer located on the first etch stop layer;

a second etch stop layer located on the first interlevel dielectric layer;

a second interlevel dielectric layer located on the second etch stop layer;

an unsegmented via located through the first and second etch stop layers and interlevel dielectric layers, the unsegmented via extending to and contacting the first metal feature and being void of a landing pad between the first and second interlevel dielectric layers;

a second metal feature located adjacent the unsegmented via and extending through the second interlevel dielectric layer and the second etch stop layer and terminating at the first interlevel dielectric layer; and

a dual damascene structure adjacent the second metal feature and having a damascene trench portion extending through the second interlevel dielectric layer and the second etch stop layer and terminating at the first interlevel dielectric layer and further including a damascene via portion extending through the first interlevel dielectric layer and the first etch stop layer and connecting the trench portion to the first metal feature.

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The examiner relies upon the following references in the rejections of the appealed claims:

Inohara et al. (Inohara)	6,163,067	Dec. 19, 2000 (filed Dec. 31, 1998)
Huang	6,127,260	Oct. 3, 2000 (filed Jul. 16, 1999)
Yoo et al. (Yoo)	6,177,340 B1	Jan. 23, 2001 (filed Feb. 18, 1999)

Appealed claims 21, 24 and 25 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Huang. Claims 21, 24 and 25 also stand rejected under 35 U.S.C. § 102(e) as being anticipated by Yoo. Claims 29 and 30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Inohara.

Appellant submits at page 5 of the principal brief that "Claims 21, 24 and 25 form a first group of claims and Claims 29 and 30 form a second group." Accordingly, claims 24 and 25 stand or fall together with claim 21, and claim 30 stands or falls together with claim 29.

We have thoroughly reviewed the respective positions advanced by appellant and the examiner. In so doing, we will sustain the examiner's rejections of claims 21, 24 and 25, but we will not sustain the examiner's rejection of claims 29 and 30.

We consider first the examiner's § 102 rejection of claims 21, 24 and 25 over Huang. Appellant contends that metal silicide layer 13 of Huang, cited by the examiner as corresponding to the

claimed first interconnect metal, is not an interconnect metal. According to appellant, metal silicide 13 of Huang is one of various components but "does not interconnect other components or circuits" (page 9 of principal brief, first line). However, we concur with the examiner's reasoning that "the metal silicide 13 provides the connection between the layer 12 and the layer 44" (page 7 of Answer, first paragraph), and, therefore, qualifies as an interconnect layer. We note that appellant's specification does not impart any particular meaning to the term "interconnect metal." Nor has appellant furnished any art-recognized definition of the term that would disqualify metal silicide 13 of Huang as an interconnect metal.

Appellant also maintains that "the lower metal plug structure 44 [of Huang] is a via, not an interconnect metal" (page 9 of principal brief, second paragraph). However, inasmuch as appellant states that "vias are metal filled openings between various layers of a semiconductor device that provide electrical connection between the layers" (id.), we find that structure 44 of Huang, whether or not considered a via, is a metal that provides interconnection in the device. Again, there is no art-recognized definition of record which disqualifies structure 44 of Huang as an interconnect metal.

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Appellant also contends that "the narrow opening 42a disclosed in Huang is not a via as recited in Claim 21" (page 10 of principal brief, first paragraph). However, inasmuch as Huang fills opening 42a with metal, there is no apparent distinction in structure between the metal-filled openings of appellant and Huang. We also observe that there is no art-recognized definition of the term "via" of record.

We now turn to the examiner's § 102 rejection of claims 21, 24 and 25 over Yoo. Appellant submits that "Yoo fails to disclose that the titanium silicide layer 9 is interconnected to any other component" (page 10 of principal brief, third paragraph). However, the examiner has made the factual determination that "Yoo clearly discloses, as shown in Figures 3, 11 and 20, the titanium silicide 9 provides the connection between the layer 27 and the source/drain regions 5b/7b" (page 8 of Answer, first paragraph). Appellant's Reply Brief has not refuted this reasonable position of the examiner.

Appellant further maintains, as with the rejection over Huang discussed above, that "those skilled in the art understand that interconnect structures are not formed in vias" (page 11 of principal brief, first paragraph). We reject this line of argument by appellant under the same rationale discussed above.

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Concerning the § 102 rejection of claims 29 and 30 over Inohara, it is appellant's position that stopper film 13a of Inohara does not meet the claim requirement of a first etch stop layer located on the first metal feature, as stated by the examiner. Appellant urges that "the silicide layer 25 lies only within an opening in the stopper film 13a, such that the stopper film 13a is not located on the silicide layer 25" (page 12 of principal brief, third paragraph, emphasis added). In response, the examiner finds the argument "not convincing because the word 'on' does not necessary [sic, necessarily] mean directly on or directly above" (page 9 of Answer, second paragraph). However, the examiner has not established that stopper film 13a of the reference is located in any which way on the silicide layer 25, either directly or indirectly. Accordingly, the examiner has not made out a prima facie case that Inohara describes each of the claimed features recited in claims 29 and 30 on appeal. As a result, we are constrained to reverse the examiner's § 102 rejection of claims 29 and 30.

In conclusion, based on the foregoing, the examiner's § 102 rejections of claims 21, 24 and 25 are affirmed, whereas

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the examiner's § 102 rejection of claims 29 and 30 is reversed. The examiner's decision rejecting the appealed claims is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (effective Sep. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sep. 7, 2004)).

AFFIRMED-IN-PART

Edward C. Kimlin
EDWARD C. KIMLIN
Administrative Patent Judge


BRADLEY R. GARRIS
Administrative Patent Judge

BOARD OF PATENT
APPEALS AND
INTERFERENCES


ROMULO H. DELMENDO
Administrative Patent Judge

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